The IRP2010 methodology can be greatly improved with better results

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Current commitments must continue

- Commitments and advanced plans must be executed
  - ESKOM must build Medupi, Kusile and Return old plants to service and address peakload needs
  - DoE, NERSA must complete execution of Independent operator, IPPs and Cogen
  - The IRP2010 and these hearings cannot be accused of increasing the chance of “load sharing” and blackouts.
- The government and various departments are committed to review the IRP periodically.
  - For IRP2012 (or the next IRP) I propose a different and better methodology which will give better results.

Methodology for IRP2012

- The current IRP2010 is a slight variation of the ESKOM expansion plan
  - It is not a national plan
- **A national plan must have the following features**
  - It must put comprehensive ***energy efficiency*** at the top of the agenda. Recommended by IEA and most energy experts. EE is by far the cheapest "source" of energy.
  - It must consider the full range of viable electricity generating technologies, ***large and small on and off grid*** .
  - These technologies must be evaluated with the same "objective" methods.
    - The current IRP2010 assumes that the initial ESKOM coal only plan is the cheapest. This is not proven.

Methodology for IRP2012

- **A national plan needs a better Methodology –National Levelised costs- R/kwh**
  - It must use a low or even zero discount rate
    - Governments cannot discriminate against future generations. Zero discount rate.
    - This agreed by most authorities. Such as our Long Term Mitigation Strategy (LTMS), the Stern Review and the California Energy Commission.
- **All externalities must be taken into account**
  - The constitution makes the government responsible for health and clean water, climate change (water acidification)
  - Governments cannot legally ignore these, private companies can legally.

National vs Private levelised costs

- National
  - Low discount rate (0..5%)
    - No discrimination against future generations
  - Calculate for all technology options
  - Externality costs
    - Government has constitutional responsibility for health, water quality etc. Cannot ignore
  - Calculate over full life of plant (25-30years)
    - Load factors taken into account

- Private
  - Higher discount rate (8% plus)
    - Shareholders short term view.
    - Ignores rising cost of fuel, pollution and carbon
    - Ignores free fuel for Renewables.
    - This arbitrary formula is biased against RE.
  - Externality cost. Private can ignore.

Methodology for IRP2012

- Governments cannot ignore future generations and damage to health of communities and environment.
  - ESKOM and private companies can
- DoE circulated the component costs (capital, operations and maintenance, fuel decommissioning costs) of a full range of technologies
  - Using these costs and the NATIONAL LEVELISED COSTS methodology and use a 30 year life of plant very different results to IRP2010 are calculated.
- Rank the technologies by NATIONAL LEVELISED COSTS

Methodology for IRP2012

- In addition to NATIONAL LEVELISED COSTS ranking
  - Each technology ranked by
    - Environmental stress (not included in costed externalities)
    - Water reticulation costs
    - Water usage
    - Job creation
    - Local manufacturing
    - exports
    - Contribute to developmental state
- This should inform rational government policy
    - What technologies to encourage and discourage

National Levelised costs Very different results.

Technology	R/kwh
COAL Pulverised Coal (ignoring externalities) and distribution cost	R 0.299/kwh
Coal-PC- Central with distribution costs. Includes externalities Lose 16% power. Price 50% more	R1.010/kwh
Coal-PC. - Central with distribution costs, externalities. Lose 16% power. Price 100% more	R1.347/kwh
Wind onshore. Assume local and no distribution costs. No storage	R0.038/kwh
Rooftop photovoltaic. Local and no distribution costs. No storage	R0.488/kwh
Rooftop PV. Learning curve Estimated levelised cost in 2020	R0.187/kwh

National Levelised costs Very different results

Technology	Costs R/kwh
Concentrated PV	R0.6125/kwh
Solar Thermal- Parabolic trough With 9 hours storage	R0.091/kwh
Solar thermal- Central receiver With 9 hours storage	R0.427/kwh
Coal with van Horen Externalities. No distribution	R0.45/kwh
CSP with storage	R0.42/kwh
Geothermal	R0.13/kwh
Rooftop PV	R0.106/kwh

Evaluate realistic scenarios

- The current IRP2010 evaluated slight variations around the ESKOM plan
  - Like comparing cars and only looking at different BMW models
- Need to evaluate many scenarios
  - Southern African “Desertec”. SAPP
  - WWF proposal
  - Greenpeace proposal
  - EE plus small wind and PV-on and off grid
  - Eskom plans
  - Invite LTMS team to propose.
  - IPP proposals

Energy Commission

- There is a strong case for a highly qualified full time Energy Commission.
  - In the past there was no climate change threat.
  - There was no danger of oil peaking.
  - There was no threat to fossil-fuel electricity generation
  - Energy efficiency was not so urgent.
  - The were no meaningful renewable energy technologies
  - We were able to get by with ESKOM as a one technology monopoly, doing the electricity planning for the country.
- Energy and electricity is essential for development and eradicating poverty and can require R thousands of billions
  - **Good sophisticated energy/electricity planning can save R hundreds of billions and get better results.**

Thank You

- Questions?
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